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insists on the intuitive origin of some of the higher mental faculties. In this we cannot follow him. His pamphlet is written in a fair and conciliatory spirit.

To one who may desire to see the views of two of the advocates of the originative and selective schools of evolution set forth, we recommend the reading of the discussion between Dr. Asa Gray and Mr. Romanes which appeared in *Nature*, closing with the number of May 24, 1883. We quote the following words from Dr. Gray, which repeat essentially the views expressed by Dr. Bennett and ourselves<sup>1</sup> at various times:

"I take Dr. Romanes now to agree with me that the physical distinction of the less fit organism, or, more generally, that the action of the environment, is not in a proper sense the cause of the advantageous variations of surviving organisms; also that natural selection does not explain and has no call to explain the cause of variation. As to this, he says, the theory merely supposes that variations of all kinds and in all directions are constantly taking place, and that natural selection seizes upon the more advantageous. Now, if variation in animals and plants is lawless, of all kinds and in all directions, then no doubt the theory of natural selection may be 'the substitute of the theory of special design,' so as to efface that evidence of underlying intelligence which innumerable and otherwise inexplicable adaptations of means to ends in nature were thought to furnish. If it is not so, then the substitute utterly fails. For omnifarious and purely casual variation is essential to it in this regard. Fitly is it said that 'the theory merely supposes' this. For omnifarious variation is no fact of observation, nor a demonstration, or, in my opinion, even a warrantable inference from observed facts. It is merely an hypothesis, to be tried by observation and experiment."

\* \* "But there is no evidence that all sorts of varieties ever appeared or tended to appear, and there is a musty maxim about 'de non apparentibus et de non existentibus,' which is not devoid of application." \* \* "The upshot is, that so far as observation extends, it does not warrant the supposition of omnifarious and aimless variation, and the speculative assumption of it appears to have no scientific value."—C.

VIALLANES' HISTOLOGY AND DEVELOPMENT OF INSECTS.—This laborious work occupies 348 pages, indeed forming nearly an entire volume (xiv) of the *Annales des Sciences Naturelles*. It is illustrated by eighteen excellent, sharply-drawn, lithographic plates. Besides the purely histological treatment, M. H. Viallanes, inspired by the epoch-making work of Weismann, has made a detailed study of the histological phenomena which accompany the post-embryonic development of insects.

The work is divided into three parts. The first comprises a

<sup>1</sup> NATURALIST, 1882, p. 457.

study of the tissues of the fully-grown larva and imago, including the teguments of the larva, and its peripheral nervous system and sensitive nervous terminations, its involuntary and voluntary striated muscles, as well as the motor nervous terminations in the voluntary striated muscles. The second part is devoted to a study of the phenomena of histolysis or destruction of the larval tissues, with especial reference to the muscles, fat-body, salivary glands and tracheæ, with a chapter on the desiccation and disappearance (chute) of the larval hypodermis. The third part comprises a study of the phenomena of histogenesis, or formation of the tissues and systems of organs of the imago, including the development of the teguments of the head and of the thorax and abdomen, likewise the development of the muscles, and of the eyes.

The work has been evidently prepared with thoroughness, and is the most important contribution of the year to the histology and metamorphosis of Arthropoda.

CASSINO'S INTERNATIONAL SCIENTISTS' DIRECTORY.<sup>1</sup>—This book is, in its present form, well arranged, and is both useful as a domestic and foreign scientific directory. The names are arranged in alphabetical order, and the American addresses are not arranged as in some of the earlier editions very inconveniently by States. We notice some omissions of importance in the German and Austrian portions, but when it is taken into account that there are in all upwards of 17,000 or 18,000 addresses of naturalists living in nearly every country under the sun, any fault-finding for sins of omission or commission are scarcely in place. The number of addresses of scientists, including amateurs, living in the United States and Canada, we should roughly estimate at about 5500; in Great Britain about 3000; in Germany 1800 (probably the number should be doubled or trebled); in Austro-Hungary 1000; while there are about 2000 French addresses. A directory of the scientific societies of the United States and Canada is added; they number about 200.

This directory is of great and constant use, as facilitating intercourse between scientific as well as amateur observers of our own and of different countries.

KUNCKEL D'HERCULAI'S ORGANIZATION AND DEVELOPMENT OF DIPTERA.<sup>2</sup>—This magnificent work, for such it truly promises to be when completed, should be at least introduced to the notice of

<sup>1</sup> *The International Scientists' Directory*. Containing the names, addresses, special departments of study, etc., of amateur and professional naturalists, chemists, physicists, astronomers, etc., in America, Europe, Asia, Africa and Oceanica. Compiled by SAMUEL E. CASSINO. Boston, S. E. Cassino & Co. 1883. 12mo, pp. 299.

<sup>2</sup> *Recherches sur l'Organisation et le Développement des Diptères et en particulier des Volucelles de la famille des Syrphides*. Par JULES KUNCKEL D'HERCULAI. Folio with numerous plates. Paris, 1875-'81.